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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,658	08/28/2003	Duncan L. MacFarlane	119941-1096	7272
7590	04/05/2005			EXAMINER HUGHES, DEANDRA M
Gardere Wynne Sewell LLP Suite 3000 3000 Thanksgiving Tower 1601 Elm Street Dallas, TX 75201-4767			ART UNIT 3663	PAPER NUMBER

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/650,658	MACFARLANE, DUNCAN L.
	Examiner	Art Unit
	Deandra M Hughes	3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 24 November 2003.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-36 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) 13-36 is/are allowed.  
 6) Claim(s) 1-12 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 28 August 2003 is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
     Paper No(s)/Mail Date 11/24/03.

4) Interview Summary (PTO-413)  
     Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Specification***

1. The abstract of the disclosure is objected to because the paragraph number [0044] must be removed. Correction is required. See MPEP § 608.01(b).

### ***Claim Objections***

2. Claim 11 is objected to because of the following informalities: 'turnable' should be 'tunable'. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-8 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numai (1.5  $\mu$ m tunable wavelength filter using a phase-shift-controlled distributed feedback laser diode with a wide tuning range and a high constant gain, 1989) in view of Bhatia (US 6,552,834 filed Feb. 15, 2001).

With regard to claim 1, Numai discloses an active optical filter comprising:

- a filter input component disposed to receive an optical input signal (fig. 1, input arrow);
- a filter output component disposed to provide a filtered output signal (output arrow);
- an optical amplifier (Active Sections);
- at least one optical delay element (phase control section);

- a surface grating coupler positioned between said optical amplifier and each of said delay elements to form a first light transmission path; (pg. 1859, col. 1, 2<sup>nd</sup> paragraph, lines 7-11; the etched grooves are the gratings and note that 'each section is electrically isolated from each other by the grooves)

Numai does not specifically claim the light transmission paths. However, the tunable filter is intended to WDM systems (pg. 1859; col. 1, lines 1-2). Further, Bhatia teaches filters in two light transmission paths (fig. 4) wherein the first light transmission path (from circulator #310b to #324b) has an end coupled to said filter input component and another end coupled to said filter output component (e.g., filter #318) and a second light transmission path (from #310c to #324a) disposed to transmit optical signals without delay from said filter input component to said filter output component. It would have been obvious to one of ordinary skill in the art (e.g., an optical engineer) to apply the tunable filter of Numai in the transmission system of Bhatia for the advantage of dropping unwanted transmission channels.

With regard to claim 2, the 2<sup>nd</sup> transmission path of Bhatia couples the input and output ends of the filter component to the input and output ends of the 1<sup>st</sup> transmission line via the circulators (#310 and #324). Further, due to the laser cavity formed by the gratings, the Examiner considers the pulse of  $\lambda_1$  to be an IIR (Numai; pg. 1860, col. 1, lines 20-24).

With regard to claims 3-4 and 6-7, two tunable active filters may be placed in the transmission paths of Bhatia (#318 and #320). Consequently, a second delay element is disclosed (#320 would have a second instance of the phase control element).

With regard to claim 5, the Examiner considers the pulse of  $\lambda$  to be a FIR (Numai; pg. 1860, col. 1, lines 20-24).

With regard to claim 8, the Examiner considers the semiconductor substrate of Numai to be a surface emitter photonic integrated circuit.

With regard to claims 11-12, fig. 2 of Numai discloses the specified transmission wavelengths or bandwidth, which is merely the inverse of frequency.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Numai in view of Bhatia as applied to claim 1 above, and further in view of Hamada (US 2003/0180023 filed Dec. 12, 2002).

Numai in view of Bhatia does not specifically disclose a surface grating comprising a crystal. However, Hamada teaches the manufacture of gratings with photonic crystals (paragraph [0017]). It would have been obvious to one of ordinary skill in the art (e.g., an optical engineer) to manufacture a grating with photonic crystals for the advantage of wavelength tunability.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Numai in view of Bhatia as applied to claim 1 above, and further in view of Shaw (US 6,456,766 published Sep. 24, 2002).

Numai in view of Bhatia does not specifically disclose a surface grating comprising trench coupler. However, Shaw teaches surface gratings comprising trench couplers (fig. 25). It would have been obvious to one of ordinary skill in the art (e.g., an optical engineer) to use a surface grating comprising a trench coupler for the advantage of maintaining optical alignment.

***Allowable Subject Matter***

7. Claims 13-36 are allowed.
8. The following is a statement of reasons for the indication of allowable subject matter.

With regard to independent claim 13, the prior art does not teach or make obvious a *plurality of optical gain blocks wherein each of the gain blocks is provided with controllable gain and delay characters selected to produce an output comprising an IIR when said input signal comprises an optical pulse* in conjunction with the other features of the claim.

With regard to independent claims 15, 29, and 22, the prior art does not teach or make obvious a *four direction coupler which exchanges specified signals directed along a second axis orthogonal to a first axis with another associated delay block* in conjunction with the other features of the claim.

With regard to independent claim 36, the prior art does not teach or make obvious a *multi-direction direction coupler, which exchanges specified signals directed along a second axis orthogonal to a first axis with another associated delay block* in conjunction with the other features of the claim.

***Information Disclosure Statement***

9. The information disclosure statement (IDS) filed on Nov. 24, 2003 has been considered by the examiner and is found to be cumulative to the art of record.

***Drawings***

10. The drawings are objected to because the shading makes them difficult to read. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to

the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Alferness, Chandrasekhar, Cimini, Deacon, Delorme, Delprat, Gerlach, Hatayama, King, Kulishov, Lee, MacFarlane, Moslehi, Nilsson, Oh, Sakata, and Tur disclose optical filters.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M Hughes whose telephone number is 571-272-6982. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas H Tarcza can be reached on 703-306-4171. The fax phone

number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Deandra M Hughes  
Examiner  
Art Unit 3663